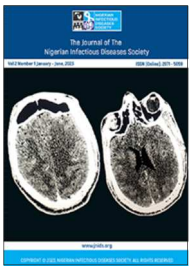
https://www.jnids.org ISSN: 2971-5059

Journal of the Nigerian Infectious Diseases Society



Case Report

Multiple Opportunistic Infections in a Patient with Advanced HIV Disease

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Received: 31 January 2023
Revised: 03 May 2023
Accepted: 13 May 2023
Published: 31 October 2023

DOI
10.58539/JNIDS.2023.2113

Quick Response Code:

Abstract

Opportunistic infections cause significant morbidity and mortality in patients infected with the human immunodeficiency virus (HIV). Although pulmonary tuberculosis remains the main opportunistic infection (OI) in people living with HIV (PLHIV), multiple OIs can occur in severely immunosuppressed PLHIV. One of the challenges in diagnosis and treatment of OIs is that they may occur concomitantly in the same patient, and they may mimic each other, leading to clinical diagnostic difficulties. Additionally, although all newly diagnosed PLHIV with features of acquired immune deficiency syndrome (AIDS) now undergo routine testing for life-threatening OIs, the limited resources available within the public HIV programme means that certain populations of patients are managed for OIs with diagnostic uncertainty. We report a case of multiple OIs (Neurocysticercosis, Pott's disease, and central nervous system [CNS] toxoplasmosis) in a 29-year-old male, who had tested positive to HIV two years prior but did not start Antiretroviral Therapy (ART) and later presented with seizures, altered sensorium and vomiting, with a CD4 count of 9 cells/mm 3. He was treated with steroids initially to prevent worsening of his neurological symptoms before appropriate antimicrobials were instituted and later, to prevent immune reconstitution inflammatory syndrome (IRIS), ART.

Key words: Opportunistic infection, HIV, immunosuppression, AIDS

INTRODUCTION

Despite the availability of preventative and treatment options, opportunistic infections (OIs) remain a leading cause of morbidity and mortality among HIV/AIDS patients .[1] HIV induces gradual depletion of CD 4 T cells , leading to life -threatening OIs or malignancies , which still contribute to HIV -related morbidity and mortality .[2] In addition , more than twenty distinct OIs have been linked to HIV infection , and patients typically encounter these co-infections during their disease .[3] The likelihood of OIs developing in people living with HIV (PLHIV) is influenced by previous exposure to potential pathogens , their virulence , the level of host immunity , and the use of antimicrobial prophylaxis.[1]

The classification of PLHIV into clinical stages takes into consideration different OIs, some of which include pulmonary and extra-pulmonary tuberculosis, severe bacterial infections , pneumocystis pneumonia , recurrent bacterial pneumonia , cerebral toxoplasmosis, seborrheic dermatitis, shingles, oral candidiasis, oral hairy leukoplakia, cryptosporidiosis , chronic isosporosis , extra-pulmonary cryptococcosis and Kaposi sarcoma.[3]

Antiretroviral therapy (ART) improves survival, boosts length and quality of life, enhances work productivity, and reduces the incidence of OIs in PLHIV by lowering viral load and increasing CD4 cell count.[4] The extensive use of ART has had the greatest impact on reducing OI-related mortality in PLHIV in countries where these medicines are available and inexpensive. Despite the successes seen with the introduction of ART at earlier stages of HIV infection, the prevalence of OIs remains unacceptably high in resource-poor countries, with studies in Africa[5, 6] and Nigeria[7] estimating a prevalence of 22.4-55.3% among newly diagnosed PLHIV, some of whom present with multiple OIs that co-exist. We present a case of a newly diagnosed PLHIV with multiple OIs in the setting of advanced HIV disease (AHD).

CASE REPORT

A 29-year-old primary school leaver, who traded clothes, presented with a two-week history of headache that worsened over the course of three days and was accompanied by disorientation and slurred speech. The headache was poorly localized; however it was exacerbated by movement of the head, and associated with an episode of vomiting.

His family also reported neck stiffness and repeated, abnormal facial twitching that resolved prior to his admission. In the months leading to his presentation, he also complained of progressive weakness of the lower extremities, accompanied by back pain, constipation, and intermittent urinary incontinence. In addition, there was a two-year history of recurrent fever, cough, and weight loss. Review of other systems was normal.

Due to these symptoms, he was initially evaluated at a primary health care facility, where he tested positive for HIV and pulmonary tuberculosis (TB), but he refused anti-TB medications and ART and became lost to follow-up. He also had a longstanding history of use of cannabis, alcohol, and herbal mixtures containing alcohol.

On examination, he was febrile with a temperature of 38.9^{0}C. He was also disoriented, with a Glasgow Coma Score (GCS) of 13/15 (Eye opening – 4, verbal response – 3, motor response – 6). He had photophobia and could not tolerate retinal examination. There was no obvious cranial nerve palsy, but his neck was stiff; however, kernig's and brudzinski signs were negative. He had mid-thoracic gibbus with power of 4/5 in both lower limbs. The sensory levels could not be assessed due to his disorientation. Other physical findings were normal.

Multiple hyper-dense nodules with central dots in the cerebrum at the grey-white matter junction and cerebellum with perilesional oedema around some of the nodules as well as ring enhancement on contrast injection, were found on a brain computed tomography (CT) scan (Fig. 1), indicating neurocysticercosis. Thoracolumbar CT scan revealed pronounced thoracic vertebral kyphosis with mild reduction in the anterior height of the T7 and T8 vertebral bodies, features suggestive of a wedge compression fracture caused by TB of the vertebrae (Pott's disease). The lung fields were clear on chest computed tomography scan.

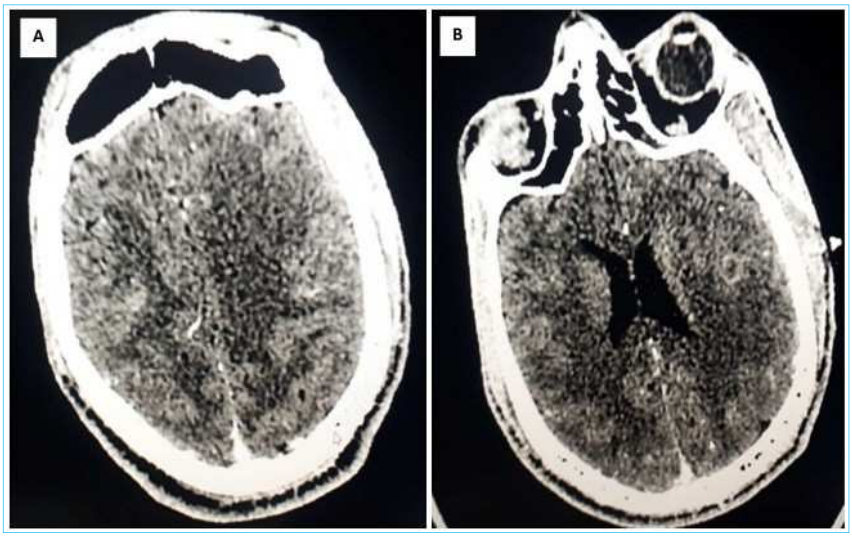

Fig. 1 (A & B): Brain CT showing multiple hyper -dense nodules with central dots in the cerebrum at the grey-white matter junction.

His blood tests revealed a CD4+ T-cell count of 9 cells/mm^3, and positive toxoplasma immunoglobulin G (IgG). Cryptococcal antigen (CrAg) test (LFA) was negative. Sputum sample for Xpert MTB/RIF assay also tested negative. Due to the findings of the brain CT scan, a previously scheduled lumbar puncture (LP) was not done. Brain biopsy was not performed due to financial restrictions.

He received steroid therapy with intravenous Dexamethasone 10mg stat then 16mg daily in four divided doses, which was gradually tapered according to clinical improvement. He also commenced oral trimethoprim/sulfamethoxazole 3,840 mg daily in two divided doses and Anti-TB medications (Rifampicin, Isoniazid, Pyrazinamide, and Ethambutol) according to the National guidelines. A week after, he started oral Albendazole 400mg daily for 30 days. Following neurosurgical consultation, he began physiotherapy. He improved clinically, and on the 10th day of admission, he was discharged home. He is regular on follow-up in our clinic, and commenced ART after 14 days of anti-TB, and he has been making sustained clinical progress.

DISCUSSION

This case brings to light the occurrence of multiple co-infections (tuberculosis, toxoplasmosis,and neurocysticercosis) in the same individual in the setting of AHD; the unavoidable deterioration in immunity in patients who are not linked to ART care in a timely manner; the need to adequately evaluate for OIs and begin prophylactic therapy; and the need to mitigate the multiple assaults of poverty, infections, and poor living conditions that enhance the risk of morbidity and mortality from tropical infectious diseases.

While the risk of developing an OI increases exponentially with worsening immune function, the widespread deployment of early ART has mitigated their occurrence markedly, especially in high-income countries. In low and middle-income countries (LMICs), especially in sub-Saharan Africa, the incidence of OIs is still an issue of concern among patients presenting with AHD. It is estimated that 1 in 3 persons diagnosed with HIV presents with AHD, a figure estimated to be higher among LMICs, including Nigeria.[3] The relationship between AHD and co-infections is a complex one. Worsening immune dysfunction in HIV not only increases the likelihood of a patient developing OIs, the occurrence of multiple OIs within the same individual also accelerates the progression of HIV infection.[8, 9] Even though the long-term implication of the occurrence of multiple OIs in this same patient remains to be seen, such a scenario does not augur well.

In addition to the occurrence of multiple co-infections, this individual presented with a CD4+ T-cell count of 9 cells/mm^3. This is clearly a function of delay in the commencement of ART, which was occasioned by his initial refusal of care.

This throws up a number of issues that have been reported among many other LMICs; high loss-to-follow-up rates, poor follow-up logistics, as well as adherence counselling in preparing patients for commencement of ART.[10]

Early ART commencement has been associated with improvement in PLHIV's long-term prognosis, not only by decreasing viral replication and boosting immune function, but also by preventing OIs.[4] Delay in starting ART remains a primary cause of illness, mortality, and HIV transmission in communities. There are numerous reasons for the delay in initiating ART, including patients' health seeking behaviour and their degree of awareness.[11] Although this patient presented early for initial evaluation and was informed of the diagnosis, he denied this diagnosis for about two years before presenting with severe HIV illness. This is most likely due to a lack of awareness about the impacts of HIV, as well as misconceptions that may have arisen as a result of misinformation. This clearly illustrates the importance of continuing to disseminate correct information to communities while also improving models for efficient follow-up of patients who stop seeking treatment.

The availability of the laboratory and imaging modalities needed to diagnose all the underlying OIs that this patient presented with was critical to his treatment. Limited evaluation of PLHIV in LMIC and premature ART initiation has been associated with an increase in mortality among newly diagnosed PLHIV who start ART.[12] The World Health Organization and Nigeria's Federal Ministry of Health have adopted an AHD treatment package to facilitate the initial evaluation of individuals with advanced HIV.[4, 13] Nonetheless, compliance with this package is still sub-optimal at many facilities. If ART was initiated without first addressing the OIs, the risk of death from immune reconstitution inflammatory syndrome (IRIS) would have increased significantly. The effort to implement this package of care on a wider scale is very important, in order to reduce both complications and death among this group of patients.

Ultimately, the challenge of infectious diseases in LMICs must be solved holistically. Infectious diseases are commonly associated with poverty, illiteracy, poor sanitation, and a high level of exposure to environmental and biological risks.[14] Multiple infections in the same person are common because certain environmental and social factors share epidemiologic characteristics with different aetiologic agents.[15] In this scenario, the different routes of transmission for the various infectious diseases is an indication of the effort that needs to be put in place towards the control of these infectious diseases. While HIV is transmitted by blood and body fluids, both toxoplasmosis and cysticercosis are transmitted through the faeco-oral route via contaminated food and water, with TB acquired via the respiratory tract. Despite the different routes of exposure, these infectious diseases are linked by the common pathways that hinder their eradication or control: poverty, illiteracy, and poor hygienic practices, all of which were present in this young man. We were limited in our ability to investigate this patient in more depth; it was not possible for him to undergo a brain biopsy and histology of the space occupying lesions, and the facilities for enzyme-linked immunoelectrotransfer blot (EITB) or enzyme-linked immunoassays (EIA) for the diagnosis of cysticercosis was not available in our hospital.

In conclusion, we report a case of AHD with multiple OIs in a young man from a low socio-economic background, with delayed ART initiation and severe immunosuppression. This emphasizes the necessity for a comprehensive strategy for early initiation of ART in PLHIV and to the control of infectious diseases, linked by common pathway such as illiteracy, inadequate sanitation, and poverty.

DECLARATIONS

Acknowledgement: Nil.

Conflict of Interest: None declared.

Funding: None.

Ethical Considerations: Approval was obtained from the Lagos University Teaching Hospital (LUTH) Human Research Ethics Committee (HREC), with approval number: ADM/DSCST/HREC/APP/5527

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How to cite this article: Omoruyi O, Onimowo JO, Jegede O, et al. Multiple opportunistic infections in a patient with advanced HIV. J Nig Infect Dis 2023; 2(1):16-19.